

CLAIMS

We claim:

1. A method of determining an initialization position of a moveable panel on a vehicle that is moved by a motor, comprising the steps of:
 - (A) determining that the panel is in a closed position;
 - (B) energizing the motor to urge the panel toward the closed position to reduce any slack between the motor and the panel; and
 - (C) determining the initialization position when there is no slack.
2. The method of claim 1, including performing step (D) when the motor is operating at a selected torque.
3. The method of claim 2, wherein the selected torque is an average torque determined when the motor is moving the panel between first and second positions spaced along the travel of the panel from an open position to the closed position.
4. The method of claim 3, including
 - determining that the motor causes the panel to move through the first position;
 - determining that the motor causes the panel to subsequently move through the second position; and
 - determining the average torque of the motor as the motor moves the panel between the first and second positions by incrementally increasing a total torque value a plurality of times during the movement between the first and second positions and dividing the total torque value by the number of the increment times.

5. The method of claim 3, including determining whether the panel was obstructed or the motor stalled during the movement between the first and second positions and only determining the average torque if the panel was not obstructed and the motor did not stall.
6. The method of claim 3, including selecting the first and second positions near the closed position of the panel.
7. The method of claim 3, including updating the selected torque each time that the motor causes the panel to move toward the closed position and using the most recent updated torque as the selected torque.
8. The method of claim 1, including providing a sensor that provides an output indicative of the panel position and wherein step (D) includes obtaining an output from the sensor when there is no slack.
9. The method of claim 1, including activating a cinching actuator that urges the panel into a completely closed position and determining a tightest closed position obtained as the cinching actuator moves the panel.
10. The method of claim 9, including determining if the tightest closed position is different than a previously determined tightest closed position and applying a correction factor to the determined position of step (D) corresponding to the difference between the tightest closed position and the previously determined tightest closed position.

11. The method of claim 9, including determining the initialization position at the time that the panel is in the tightest closed position.
12. The method of claim 9, including monitoring a position sensor output and determining the tightest closed position as that corresponding to a minimum sensor output.
13. The method of claim 1, including determining that there is no slack by determining that the motor operates at a constant torque during step (C).
14. The method of claim 1, wherein the motor is selectively coupled to the panel through a clutch and the method includes determining that the clutch is engaged before performing step (B).

15. A system for moving a moveable panel, comprising:
- a motor;
 - a coupling that couples the motor to the panel and includes a varying tension between the motor and the panel;
 - a position sensor associated with the coupling that provides an indication of the panel position;
 - an indicator that provides an indication when the panel is in a closed position;
 - and
 - a controller that energizes the motor responsive the closed position indication to urge the panel toward the closed position to reduce any slack between the motor and the panel, the controller obtaining an initialization position indication from the position sensor when there is no slack.
16. The system of claim 15, wherein the controller obtains the initialization position indication only when the motor is operating at a selected torque level that corresponds to an average torque determined when the motor is moving the panel between first and second positions spaced along the travel of the panel from an open position to the closed position.

17. The system of claim 16, wherein the controller determines that the motor causes the panel to move through the first position, determines that the motor causes the panel to subsequently move through the second position, and determines the average torque of the motor as the motor moves the panel between the first and second positions by incrementally increasing a total torque value a plurality of times during the movement between the first and second positions and dividing the total torque value by the number of the increment times.

18. The system of claim 16, wherein the controller determines whether the panel was obstructed or the motor stalled during the movement between the first and second positions and the controller only determines the average torque if the panel was not obstructed and the motor did not stall.

19. The system of claim 18, wherein the controller updates the selected torque each time that the motor causes the panel to move toward the closed position and uses the most recent updated torque as the selected torque.

20. The system of claim 15, including a cinching actuator that urges the panel into a completely closed position and wherein the controller determines a tightest closed position obtained as the cinching actuator moves the panel.

21. The system of claim 20, wherein the controller determines if the tightest closed position is different than a previously determined tightest closed position and applies a correction factor to the determined initialization position corresponding to the difference between the tightest closed position and the previously determined tightest closed position.

22. The system of claim 20, wherein the controller determines the initialization position from the position sensor indication corresponding to the tightest closed position of the panel.

23. The system of claim 15, including a clutch that selectively couples the motor to the panel and wherein the controller determines that the clutch is engaged before the motor is energized to take up the slack.